

Elevation Derivatives for National Applications (EDNA) Stream Gradient

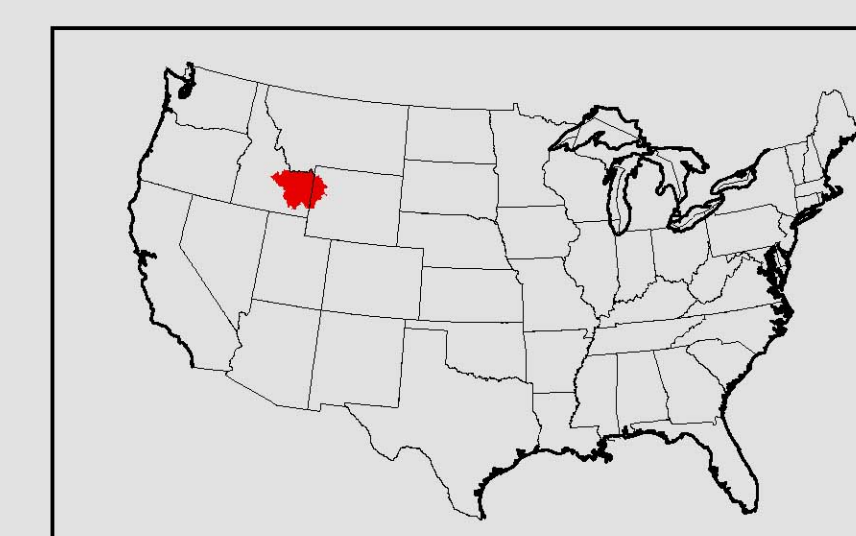
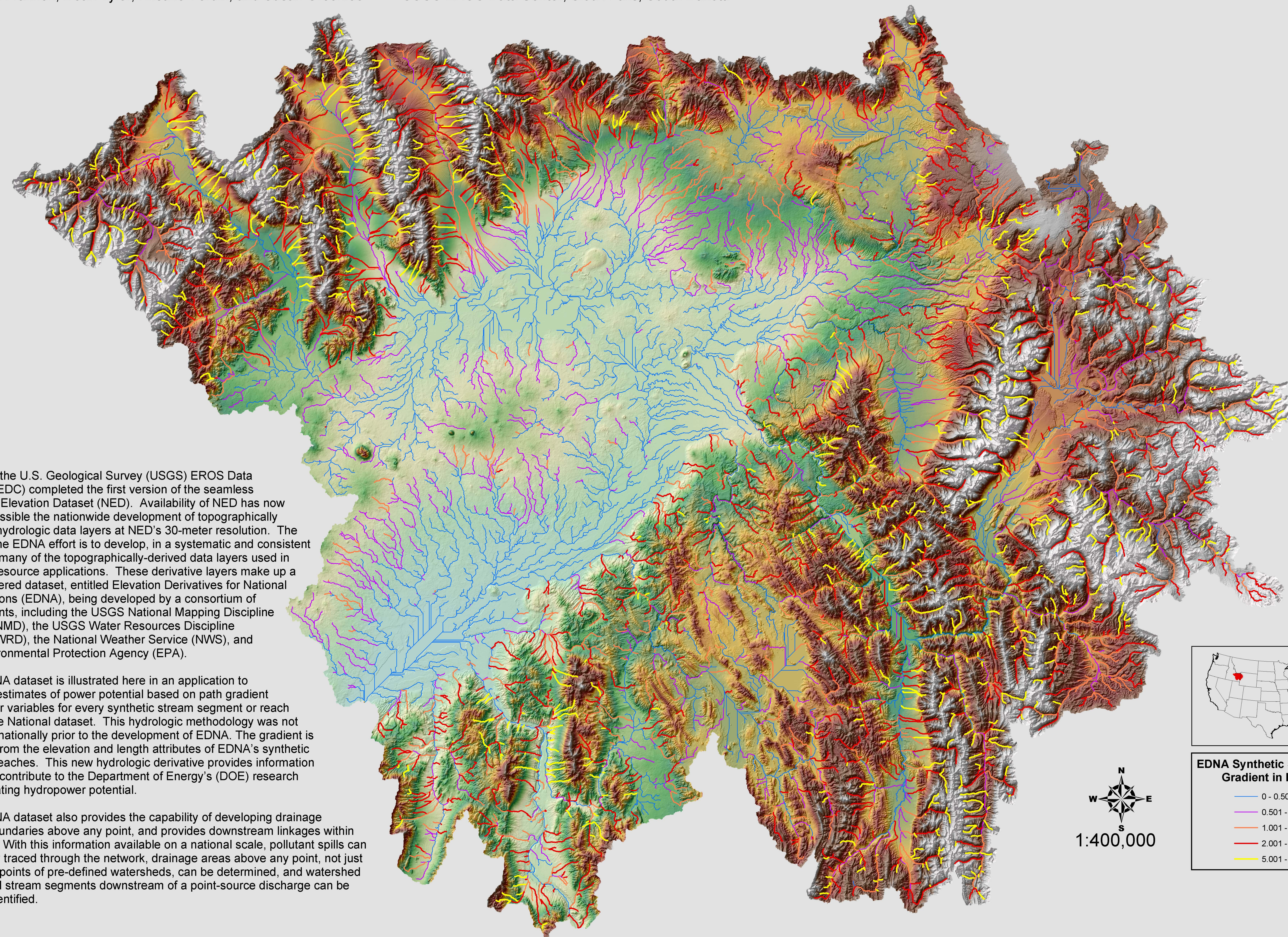
by Sandra Franken, Dean Tyler, Kristine Verdin, and Susan Greenlee

USGS EROS Data Center, Sioux Falls, South Dakota

In 2000, the U.S. Geological Survey (USGS) EROS Data Center (EDC) completed the first version of the seamless National Elevation Dataset (NED). Availability of NED has now made possible the nationwide development of topographically derived hydrologic data layers at NED's 30-meter resolution. The goal of the EDNA effort is to develop, in a systematic and consistent fashion, many of the topographically-derived data layers used in natural resource applications. These derivative layers make up a multi-layered dataset, entitled Elevation Derivatives for National Applications (EDNA), being developed by a consortium of participants, including the USGS National Mapping Discipline (USGS/NMD), the USGS Water Resources Discipline (USGS/WRD), the National Weather Service (NWS), and the Environmental Protection Agency (EPA).

The EDNA dataset is illustrated here in an application to provide estimates of power potential based on path gradient and other variables for every synthetic stream segment or reach within the National dataset. This hydrologic methodology was not feasible nationally prior to the development of EDNA. The gradient is derived from the elevation and length attributes of EDNA's synthetic stream reaches. This new hydrologic derivative provides information that can contribute to the Department of Energy's (DOE) research in estimating hydropower potential.

The EDNA dataset also provides the capability of developing drainage basin boundaries above any point, and provides downstream linkages within the U.S. With this information available on a national scale, pollutant spills can be easily traced through the network, drainage areas above any point, not just terminal points of pre-defined watersheds, can be determined, and watershed units and stream segments downstream of a point-source discharge can be easily identified.



**EDNA Synthetic Streamlines
Gradient in Percent**

- 0 - 0.500
- 0.501 - 1.000
- 1.001 - 2.000
- 2.001 - 5.000
- 5.001 - 50.000

